TEMPORARY TRAFFIC BARRIER AND METHOD OF PROVISION THEREOF

The invention relates to a temporary traffic barrier unit, comprising a barrier tape dispenser suitable for mounting on a portable road traffic control upright, such as a road traffic cone or the like, such as to dispense tape to serve as a barrier, and in particular a temporary or deployable barrier. The invention also relates to a method of deploying a barrier, in particular a temporary barrier, comprising the use of such dispenser devices.

Temporary road traffic control uprights, such as road traffic cones or the like, warning triangles and signage are well established as means by which areas of roadway can be cordoned off or otherwise delineated and/or hazard warnings can be indicated on a temporary basis. The need for such delineation may arise for a variety of established reasons, including separation and direction of streams of traffic, indicating a prohibition of vehicular or pedestrian access to a restricted area, for example during periods of road repair, giving a warning of or delineating the area of a temporary stationary hazard, such as a broken down vehicle, accident, spillage or the like.

The invention relates to a barrier tape dispenser suitable for use with a wide range of temporarily deployable upright traffic control structures which can be deployed either singularly or particularly in array to delineate areas and/or give warnings in the manner above described. Such structure are often referred to as "traffic cones", and similar references frequently made herein for convenience and exemplification. It will however be understood by those skilled in the art that such references to "cones" are not mathematically descriptive of the structures in question, which may in this context comprise conical, pyramidal, cylindrical and other upright structures, whether free

standing, including separable stands, or temporarily road-mounted. In the context of the present invention it will also be appreciated that it can be construed as including temporarily deployable signage, in particular such as warning triangles and the like.

One convenient use for road traffic cones and the like is to deploy them in an array as a barrier. Such road traffic cones are easily deployable and conveniently transportable. Nevertheless, a barrier comprises entirely of cones is not without its limitations. To be effective, such a barrier is likely to need a large number of cones placed relatively closely together. This increases costs, and is time consuming to deploy.

Accordingly, to reduce the number of cones required for a given barrier, it is known to provide barrier systems wherein road traffic cones are spaced more widely and lateral extensions are provided linking therebetween. For example, cones might be provided with means to mount rigid lateral plastic extensions with suitable hazard markings therebetween. Such structures are however cumbersome in transportation and assembly. Moreover, the rigid lateral pieces in the structures are generally of fixed lengths which offer limited flexibility when the areas for which a barrier is required are liable to be of variable shape and dimension.

It is also known to tie lengths of plastic tape, provided with a suitable hazard pattern, between the cones. Such systems are crude, can be difficult to handle particularly in the wind, and are not practically recyclable and are therefore environmentally limited.

To address some of these objections, UK Patent No. 2152563 describes a plastic strip specifically adapted for engagement with the upright parts of road

traffic cones. This specifically adapted tape offers some advantages, but is nevertheless still difficult to store compactly, to transport, and to handle, particularly in windy conditions.

A further use of temporary deployable traffic control uprights, including simple cones and other temporary signage such as warning triangles whether deployed singularly or in an array, is to give warning of and/or delineate a stationary hazard in the road, such as a broken down vehicle spillage, obstruction or the like. Where the intention is to give a warning, the relatively small size of single cones and warning triangles limits visibility at a distance and can reduce the effectiveness of the warning. Where the intention is to provide cordon delineating the hazard, a single warning triangle, signage or cone will not suffice, and an array will be required with the attendant drawbacks listed above.

It is an object of the present invention to provide a temporary barrier unit mountable upon a temporary road traffic control upright which mitigates some or all of the above disadvantages.

It is a particular object of the present invention to provide a temporary barrier unit mountable upon a temporary road traffic control upright that lends itself to easy storage, convenient transportation to a barrier site, and easy handling even in difficult environmental conditions.

It is a particular object of the present invention to provide a temporary barrier unit mountable upon a temporary road traffic control upright that is adaptable to provide a variable sized barrier between two such uprights or one such upright and a fixed structure and/or that is adaptable for incorporation into a

system comprising a barrier delineating an area of complex and variable shape.

Thus, according to the present invention in a first aspect there is provided a temporary traffic barrier unit suitable for mounting on a road traffic control upright such as a road traffic cone or the like comprising a tape cartridge, hollow to define a tape storage cavity, a spindle rotatably mounted in the tape storage cavity having tape wound thereon, a deploying aperture in the tape cartridge through which at least a leading edge of tape projects externally, to allow the tape in use to be dispensed therefrom by unwinding from the spindle, a receiving means on the tape cartridge to engagingly receive a leading edge of tape from another like cartridge in use, mounting means associated with a lower part of the cartridge to mount the tape cartridge on or about an upper part such as an apex of the road traffic control upright.

Thus, for use, the cartridge is mounted generally above a road traffic cone or other upright. Tape is unwound from the spindle within the cartridge and pulled out through the deploying aperture. To complete a barrier, a second tape cartridge is mounted upon a second upright, or a terminating mounting of equivalent configuration is otherwise provided at a second remote site. The leading edge of tape dispensed from the first cartridge is received and engaged upon a receiving means provided on the second cartridge or by the mounting. Large barriers of complex shape can be constructed using multiple cartridges and multiple uprights.

The arrangement is compact and easily stored, taking up little space, yet adapts to the provision of a wide variety of sizes and shapes of barrier. The cartridge is stably engaged generally above the upright, and is thereby readily deployable to a variety of lengths. After use, the tape may be withdrawn back

and reeled back into the cartridge and rewound onto the spindle for storage and reuse. Thus the tape is compactly stored and is reusable.

The tape cartridge engages above a road traffic cone or other traffic control upright by means of the mounting means associated with a lower part thereof. The mounting means are preferably adapted to engage on or about the uppermost part of the road traffic upright, and in particular on or about the apex of a road traffic cone or the like in interference fit. For example, the mounting means may comprise a tubular lower portion of suitable shape to co-operably engage with the upright, for example a cylindrical lower portion to engage with an upright with an upper portion of circular cross section. The tubular lower portion preferably comprises flexibly resilient material and/or is slotted such as to be resiliently deformable as the cartridge is pushed onto the upper portion of the upright to effect the interference fit.

Other additional or alternative mounting means will readily suggest themselves. For example, the mounting means may comprise mutually co-operable and slots or the like, providing for sliding and/or rotational engagement, or may comprise screw fixings, or may comprise mutually co-operable aperture and rod fixings, such as bolt arrangements. Any combination of fittings is suitable for the mounting means. However, it is preferable if the mounting means are adapted for engagement on or around the apex of a road traffic cone, warning triangle or the like of conventional design, so that the device can be fitted to existing cones, triangles and other warning signage and does not require especially co-operably manufactured cone designs.

It will be understood that references herein to temporary road traffic control uprights, or to road traffic cones, triangles or other warning signage are

references to temporary and portable structures for placement on a road way comprising generally a stable ground engaging portion, which may be an integral platform portion, a separable stand, or means to engage temporarily in to the road surface itself, and a generally upright portion. The generally upright portion may or may not be generally tapering, and may or may not taper in a mathematically conical manner. For example, truncated conical, generally pyramidal or truncated pyramidal or cylindrical shapes will be familiar. Additionally, generally two-dimensional shapes such as warning triangles and like signage will also be familiar.

The tape is of any flexibly resilient elongate material suitable for winding onto and off the spindle. Optionally, the tape comprises an elongate flexible strip, a rope or a cord. Conveniently, the tape comprises an elongate thin flexible strip of material, for example of plastics sheet material or woven or non-woven fabric material. The width of the material is determined by the need for flexibility and the given application, but is likely to be in the range 2cm to 10cm or thereabouts. The length of the material is determined by likely desired lengths between two mounting points in a barrier, and by the storage capacity of the cartridge.

The tape is preferably comprised of material and/or provided with a surface pattern or surface layer of material incorporating suitable hazard warning markings or information, for example in alphanumeric form, in the form of brightly coloured stripes, chevrons or the like. Preferably, the tape comprises or incorporates a reflective surfaced material so as to be readily illuminated by reflection (e.g. in car headlights) for safety at night.

The tape may also be fabricated from material and/or surface treated for weather resistance etc.

To obviate problems which might be associated with strong winds, the tape can be perforated/reticulated, especially where the tape is relatively wide.

The tape cartridge sits upon and above the uppermost portion of the road traffic control upright, for example at the apex of the cone or triangle, and accordingly the tape barrier strip sits at a higher level than that in GB 2152563. This can improve visibility, and enhance the functionality and safety of the barrier. In a preferred embodiment, to increase this still further, the cartridge incorporates a means for height adjustment, whereby the height at which a tape dispensing portion of the cartridge seats in use can be varied. The means for height adjustment may comprise mutually telescoping or folding cartridge portions and/or detachable extending portions to raise the height of the dispensing part of the cartridge away from the mounting means in engagement with a cone or other upright in use.

In one embodiment the cartridge is conveniently generally cylindrical for engagement above a cone of circular cross section. In an alternative embodiment the cartridge has a slotted lower portion for engagement with the apex of a flat warning triangle.

The spindle is rotatably mounted, especially such as to seat generally above a vertical axis midline of an upright, and in particular where the upright has rotational symmetry about a vertical axis, to seat generally above that in use to give enhanced stability. One end of the tape is fixedly mounted to the spindle, and the tape is wound thereon such that another free end of the tape is able to protrude through the deploying aperture for dispensing.

Means are provided to facilitate restowage of the tape after use from a dispensed configuration to a stored configuration wound upon the spindle. At its simplest, means might merely be provided to allow the spindle to be rotated in a suitable direction to rewind the tape for example linked to an externally accessible winding handle or other means. Conveniently however, the spindle comprises means for biasing tape wound thereon to a stowed position. In particular, for example, the means for biasing the tape to a stowed position comprises spring biasing means acting on the spindle to tend to urge the spindle to rotate in a direction which would tend to rewind the tape. This has three advantages in particular. First, it simplifies the rewinding process after use. Second, it maintains the dispensed tape in tension in use so that the material of the tape need not have significant rigidity to comprise an effective generally horizontal barrier between two cones, other uprights or other mounting sites. Third, it tends to draw tape back into tension when it has been stretched in use, for example by the wind.

Releasable locking means may be provided to lock the spindle into position when the tape is dispensed a predetermined desired amount. Additionally or alternatively an inertia reel lock may be provided in association with the spindle which when deployed allows some limited play in the tape, but prevents excessive sudden further deployment.

The tape leading edge is preferably provided with a stopper, suitably sized and shaped to engage against the deploying aperture as the tape is withdrawn to prevent the leading edge from being drawn entirely back into the cavity and facilitate future dispensing.

The tape leading edge preferably has a connecting portion to be engagingly received in the receiving means of a second cartridge or other like device in

use to form a barrier portion. Preferably, the connecting portion is a rigid projecting portion, and the receiving means comprises an apertured receiving means.

Conveniently, the connecting portion and the stopper may be provided by the same component. For example, the leading edge of the tape may comprise a rigid end rod suitably sized to be unable to fit through the dispensing aperture, and suitably shaped to engage with a co-operating apertured portion comprising the receiving portion of a cartridge.

Preferably, a plurality of receiving means are provided disposed radially at several angles around the cartridge. This allows construction of adjacent barrier sections at a plurality of different angles, and allows construction of complete barriers of complex shape.

Conveniently, the deploying aperture incorporates means to clean the surface(s) of the tape as it is wound/rewound onto the spindle after use. For example, close fitting brushes may be provided which bear upon a surface or surfaces of the tape as it is withdrawn, to brush off accumulated dirt or the like so that this is not drawn into the cartridge when the tape is stowed.

According to the present invention in a second aspect there is provided a road traffic control upright such as a traffic cone to serve as a road barrier comprising a tape dispenser as hereinbefore described engaged upon and/or about an uppermost part thereof.

According to the invention in a third aspect there is provided a barrier comprising at least one road traffic control upright on at least one of which is mounted a cartridge as hereinbefore described, with tape deployed therefrom

extending to a receiving means on another cartridge and/or an equivalent receiving means on an alternative fixed location, and in the preferred embodiment (that is, in an embodiment comprising a plurality of uprights and cartridges,) extending between at least some of the said dispenser cartridges. Optionally, the mounting sites created by one or more such cartridges may be replaced by one or more terminating mountings of equivalent configuration for fixing to other fixed structures.

The invention in a fourth aspect also comprises the use of one or more cartridges as hereinbefore described in conjunction with one or more temporary deployed uprights such as cones as hereinbefore described, and optionally further in conjunction with terminating mountings on one or more other fixed structures, which term were used herein includes stationary vehicles or other hazards, to form a temporary deployable barrier. Thus one or more tape lengths are deployed from one or more cartridges to make up the barrier, being fixed to a series of temporary deployable uprights and/or to one or more such fixed sites.

According to the present invention in a fifth aspect there is provided a method of forming a barrier, and in particular a temporary deployable barrier, which comprises the steps of: providing at least one, and in a preferred embodiment a plurality of road traffic control uprights such as road traffic cones or the like; mounting tape cartridges as hereinbefore described on or about an uppermost part of at least one of the said uprights; dispensing tape from at least one such tape cartridge; engaging the leading edge of the dispensed tape from the at least one said cartridge to a receiving means on another such cartridge and/or to an equivalent receiving means on an alternative fixed location.

In the preferred embodiment, a plurality of uprights and cartridges make up a barrier. However, as above, one or more terminating mounting units on suitable fixed structures can take the place of cartridges. In this case, in a preferred embodiment of the method, at least one terminating mounting unit is provided adapted for mounting on a fixed structure, and in particular to the body of a stationary vehicle, provided with a receiving means identical to the receiving means on the said cartridge(s), and the method includes engaging the leading edge of the dispensed tape from at least one of the said cartridges to the receiving means on such a terminating mounting unit.

The invention will now be described by way of invention only with reference to Figures 1 to 6 of the accompanying drawings, wherein:

Figure 1 is partially cut away view of a cartridge in accordance with the invention with the tape undeployed;

Figure 2 is a view of the cartridge of Figure 1 in intact formation;

Figure 3 is an illustration of the connection of the tape from the cartridge of Figure 1 with another like cartridge;

Figure 4 is an illustration of a barrier formed by the cartridges of the embodiment of the invention;

Figure 5 is an illustration of a warning barrier formed by two warning triangles;

Figure 6 is an illustration of a warning barrier formed by one warning triangle and a stationary vehicle.

Referring first to Figure 1, a cartridge (1) is shown consisting of a moulding of suitable high impact plastics material such as polypropylene. The cartridge (1) is of generally cylindrical cross section, defining a tape storage cavity (3).

Within the tape storage cavity (3) is mounted a vertical cylindrical spindle (5), which is mounted for rotation relative to the cartridge (1) about an axis generally coaxial with the cylinder comprising the cartridge (1).

Shown in an undispensed configuration wound around the spindle (5) is a length of tape (7) comprising PVC with a reflective surface and a suitable alarm marking material consisting of alternate red and white chevrons (9a, 9b). A distal end of the tape is provided with a rigid plastic rod like portion (11) which, as will be seen from later drawings, serves both to prevent the tape being drawn wholly back into the cartridge and to effect connection of the tape when deployed with another like cartridge.

The tape dispenser is biased to the stowed configuration by means of a spring biasing means (not shown) acting on the spindle (5) and tending to urge it in a clockwise direction when viewed from above in this instance, such as to tend to urge the tape to be rewound.

A lower hollow cylindrical portion (8) allows the cartridge to be retained on a cone in use. The cartridge is pushed onto the apex of a cone and retained by an interference fit.

In Figure 2, a cartridge (1) is shown without any tape present for illustrative purposes. In use, the tape will protrude through the deployment aperture (13). The deployment aperture (13) is provided with a pair of close fitting brushes (15) which in use will bear upon a portion of tape as it passes out, and more particular back in, through the brushes, and serve to remove accumulated dirt and debris from its surfaces so that the accumulated dirt and debris is not brought back into the cavity within the cartridge.

Figure 2 also illustrates a receiving connecting portion (17) whose operation will be seen in relation to Figures 3 and 4. In the present embodiment, receiving portions (17) are provided at right angles radially in three positions on the cartridge (1), with the fourth position at right angle radially comprising the dispensing aperture. This gives a good degree of flexibility in constructing a variety of barrier structures. In other instances, alternative arrangements of receiving connectors (17) will give alternative functionality.

Figure 3 illustrates the connecting action. The rod (11) at the leading end of the dispensed tape (7) dispensed from a first dispenser cartridge (not shown) is adapted to slidingly engage with the receiving projection (17) of the second dispenser cartridge (21) in Figure 3. Thus, the tape is caused to extend between the two cartridges and form a barrier. It can be noted that the rod (11) is configured to be wider than the deploying aperture (13) in its respective cartridge, and accordingly, it also serves to prevent the end of the tape from being entirely drawn back within the cartridge when the tape is withdrawn after use.

In Figure 4, a plurality of devices in accordance with this embodiment of the invention are shown engaged upon a series of road cones (25) to form a barrier. It can be seen that in accordance with the invention intermediate cones may be dispensed with, making the barrier easier and cheaper to deploy. The tape provides an excellent barrier material, suitable for delineating the area around which the barrier is placed with enhanced safety, good visibility and ease of deployability.

Figures 5 and 6 illustrate alternative uses of the invention in conjunction with hazard warning triangles. In each case the hazard warning triangles comprise a flat triangle of reflective plastic (26) and its deployable stand (27) adapted to

be deployed to enable the triangle to be erected in a generally upright position for use. The triangle serves as a hazard warning, and in particular is carried by a vehicle to be deployed as a hazard in the event of breakdown, accident etc. A problem with such a warning triangle is that it is relatively small, and accordingly the distance of which it gives an effective warning is limited.

In accordance with the examples shown in Figure 5, this warning capability is enhanced by use of two cartridges (1) in accordance with the invention mounted upon two such warning triangles (26) to provide a temporary warning barrier formed by the tape (7) from one of the cartridges being extended therebetween and engaged in a receiving means of the other cartridge.

In Figure 6, an alternative embodiment is shown which employs a single triangle (26), a single cartridge (1), and terminating mounting (31) integrally provided with or mounted upon a vehicle (32). In this instance, the tape (7) from the cartridge (1) is again deployed to form a barrier to give a more effective warning, but the leading edge of the tape (7) from the cartridge (1) is in this instance engaged not in the receiving means of another cartridge, but in equivalent receiving means provided in the receiving unit (31) on a vehicle (32). In this way the vehicle itself serves as one of the end points and support points of the barrier and a barrier can be formed with just a single upright. It can be seen that the combination of warning triangle (26) and barrier tape (7) is a more effective and more visible warning than the warning triangle alone.